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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/578,729 | 05/10/2006 | Hideo Morimoto | 07700/073001 | 4455 |

22511 7590 02/29/2008

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| EXAMINER | |
|---|---|
| PATEL, PUNAM | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2855 | |

| NOTIFICATION DATE | DELIVERY MODE |
|---|---|
| 02/29/2008 | ELECTRONIC |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/578,729 | MORIMOTO, HIDEO | |
| | Examiner | Art Unit | |
| | PUNAM PATEL | 2855 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-20* is/are rejected.

7)☒ Claim(s) *5 and 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *5/2/07, 3/28/07, 5/10/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

Figures 16, 17, 18A, 18B, 18C, and 19 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### *Double Patenting*

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 2, and 16-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2, 7, 9, and 10 of copending Application No. 10/574,253. Although the conflicting claims are not identical, they are not patentably distinct from each other because both disclose a piezoresistive strain gauge based force sensor (wherein the diaphragm of 10/574,253 teaches the interconnecting portion of 10/578,729).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-4 and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant's Admitted Prior Art (AAPA).**

With respect to Claims 1-4 and 16, Applicant's Admitted Prior Art (AAPA) discloses a strain gauge type sensor (#500) characterized in that the sensor comprises:

a strain generation body (#510) comprising a columnar force receiving portion (#511) to which a force is applied,

a fixed portion fixed to a supporting body (#512), and an interconnecting portion (#513) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion;

six first piezoresistive strain gauges disposed on the interconnecting portion of the strain generation body (R512 & R513; R522 & R523; R532 & R533);

six second piezoresistive strain gauges disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge (R511 & R514; R521 & R524; R531 & R534), wherein each set of two first (R and two second strain gauges are arranged on each of three straight lines different from each other (Fig. 17); and

the interconnecting portion has an annular shape, such that the quantity of strain at the position where the first strain gauges are disposed is smaller than the quantity of strain at the position where the second strain gauges are disposed(Specification, ¶ 6 clearly states that the strain generated at the outer edge of the diaphragm is extremely smaller than the strain generated at the inner edge). Note that the method by which strain is induced (I.e. applying equal stresses) is not given patentable weight in an apparatus claim.

With respect to Claims 17-19, AAPA teaches a plurality of strain gauges type sensors on a single plane (Fig. 17, R511-R514 & R521-R524) arranged around a center point at 90 degree intervals at the same distance from the center point.

**Claim 13 is rejected under 35 U.S.C. 102(b) as being anticipated by Kabushiki (JP 03-20635).**

With respect to Claim 13, Kabushiki discloses a strain gauge type sensor characterized in that the sensor comprises:

a strain generation body (#20) comprising a columnar force receiving portion (#21) to which a force is applied,

a fixed portion fixed to a supporting body (#22), and an interconnecting portion (#23) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion;

a first strain gauge (R) disposed on the interconnecting portion on a first diaphragm (#23);

a second strain gauge (R placed over #25) disposed on the interconnecting portion on a second diaphragm at a position nearer to the fixed portion than the first strain gauge on; and

the interconnecting portion comprises the first and second diaphragms (#23 and the portion under #25), wherein the thickness of #23 is less than the thickness of the portion under #25 (wherein this structural arrangement is understood to provide a substantially equal output from the first and second strain gauges). Also see MPEP 2113 [R-1]

**Claims 1, 7, 8, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Enplas (JP 2514974).**

With respect to Claims 1, 7, 8, and 14, Enplas discloses a strain gauge type sensor characterized in that the sensor comprises:

a strain generation body comprising a columnar force receiving portion (#33) to which a force is applied,

a fixed portion fixed to a supporting body (#31), and an interconnecting portion (#32) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion;

a first strain gauge disposed on the interconnecting portion of the strain generation body (19-2 & 19-3);

a second strain gauge disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge (19-1 & 19-4); and

the interconnecting portion gradually decreases in thickness from the position where the first strain gauge is disposed toward the position where the second strain gauge is disposed thus resulting in a difference in thickness between the two positions (wherein this structural arrangement is understood to be operable such that the output of the first strain gauge is substantially equal to the output of the second strain gauge during the application of a force to the force receiving member; See Figs. 1 & 3). Note that the method by which strain is induced (I.e. applying equal stresses) is not given patentable weight in an apparatus claim. With respect to Claims 8 and 14, the patentability of a product/apparatus does not depend on the method of production. In this instance Enplas teaches a difference in thickness of the interconnecting membrane. The manner of setting the thickness is not given patentable weight since no further

structural limitations are provided that distinguish the apparatus of Enplas from Applicant's claimed invention. MPEP 2113 [R-1]

**Claims 1, 9, 10, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Rogne et al. (US 6,595,063).**

With respect to Claims 1, 9, and 15, Rogne et al. disclose a strain gauge type sensor characterized in that the sensor comprises:

a strain generation body (Fig. 3A, the entire senor element) comprising a force receiving portion (#4) to which a force is applied,

a fixed portion fixed to a supporting body (#3), and an interconnecting portion (the diaphragm, #s 2 and 1, extending between the fixed portions, #3) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion;

a first strain gauge disposed on the interconnecting portion of the strain generation body (Fig. 2, #s 12 and 14);

a second strain gauge disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge (Fig. 2, #s 11 and 13);

wherein the interconnecting portion is in the shape of a thinned diaphragm that is symmetric for providing an even distribution of the strain (col. 2, lines 21-25);

a first connecting portion with a 90 degree curvature between the force receiving portion (#4) and the interconnecting portion (#2); and

a second connecting portion with a curvature greater than 90 degrees (see Fig. 3A) between the fixed portion (#3) and the interconnecting portion (#1).

With respect to Claims 10 and 15, the patentability of a product/apparatus does not depend on the method of production. In this instance Rogne et al. teach a difference in curvature of the two connecting portions. The manner of setting the difference is not given patentable weight since no further structural limitations are provided that distinguish the apparatus of Rogne et al. from Applicant's claimed invention. MPEP 2113 [R-1]

**Claims 1, 17, 18, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Vick (US 3,456,226).**

With respect to Claims 1, 17, 18, and 20, Vick teaches a strain sensor comprising:

a strain generation body (Abstract, the entire force transducer) comprising a force receiving portion (the center of #10) to which a force is applied (col. 1, lines 64-66);

a fixed portion fixed to a supporting body (col. 1, lines 64-65, rigidly supported at it's periphery & #20), and an interconnecting portion (col. 1, lines 32-33 & #10, the slightly flexible diaphragm) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion (col. 1, lines 66-67, the flexure strain);

a first strain gauge disposed on the interconnecting portion of the strain generation body (col. 4, lines 49-50 & Fig. 4);

a second strain gauge disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge (col. 4, lines 51-52 & Fig. 4, the three strain gauges);

wherein the strain gauges are on a single plane (111);

the interconnecting portion is in the shape of a circular diaphragm (Fig. 4, the three strain gauges);

the first strain gauges are arranged around a center point at regular 120 degree intervals at the same distance from the center point; and

the second strain gauges are arranged around a center point at regular 120 degree intervals at the same distance from the center point (see Fig. 4).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (AAPA) in view of Johnston et al. (J. Johnston and K. Coffey. "Getting the most out of Strain Gauge Load Cells" *Sensors*. May 2000. Accessed online on 02/19/2008 <http://archives.sensorsmag.com/articles/0500/52/index.htm>).**

With respect to Claims 11 and 12, AAPA teach a strain gauge type sensor comprising:

a strain generation body (#510) comprising a force receiving portion (#511) to which a force is applied,

a fixed portion fixed to a supporting body (#512), and an interconnecting portion (#513) that interconnects the force receiving portion and the fixed portion and in which strain is generated according to the force applied to the force receiving portion;

a first strain gauge disposed on the interconnecting portion of the strain generation body (R512 & R513; R522 & R523; R532 & R533); and

a second strain gauge disposed on the interconnecting portion at a position nearer to the fixed portion than the first strain gauge (R511 & R514; R521 & R524; R531 & R534). The gauges of AAPA are connected to form various Wheatstone bridge circuits (Figs. 18a-c).

However, AAPA fails to teach the first strain gauge being shorter than the second strain gauge. Johnston et al. teach a well known manufacturing method of trimming strain gauges (understood to be altering the length) that are arranged/connected in a Wheatstone bridge in a load cell (pages 3-4). It is understood that any of the strain gauges connected in the bridge circuit maybe trimmed until an ideal combination of lengths results in the desired output from the bridge. It would have been obvious to one of ordinary skill in the art at the time of the

invention to trim the first strain gauge of AAPA, such that it is shorter than the second strain gauge, as taught by Johnston et al. in order to manually compensate for the offset temperature drift in the Wheatstone bridge, such that the load cells are linear (wherein linearity is understood to result from gauges having substantially equal output) and accurate (Johnston et al., page 4).

### *Allowable Subject Matter*

Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art made of record (US 5,035,148) teaches two diaphragms are connected by a portion that is thicker than the first diaphragm (see Figs 31 and 32), but fails to explicitly teach and lacks reasonable motivation for placing the first strain gauges on the first diaphragm and the second strain gauges on the second diaphragm.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PUNAM PATEL whose telephone number is (571)272-6794. The examiner can normally be reached on Monday to Friday 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Edward Lefkowitz/
Supervisory Patent Examiner, Art Unit 2855

PP
02/19/2008